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FORSYTH'S THEORY OF FUNCTIONS OF A COMPLEX VARIABLE.*

By PROF. W. H. ECHOES, Charlottesville, Va.

There is just out of the Cambridge University Press a book which will mark an epoch in mathematics for English and American students. It puts the English speaking mathematical student in possession, for the first time in his own tongue, of those splendid developments in analysis which have been created in the last few years, and which are being created to-day. Heretofore, he has had to go to the journals, special memoirs, treatises in French and in German, or to Germany itself, to get an insight of what has been, and is being done, in this far reaching living field of research.

This splendid book will be most heartily and gratefully welcomed by the American student, who can now read in the pure, strong, and simple English of Forsyth these beautiful theorems, whose discovery has made immortal the genius of the master mathematicians of our century. A marked feature of the work is the complete reference in the body of the text, as well as in the footnotes, to authors and their works ; and one cannot fail to be impressed by the marked absence from among them of English names.

The Cambridge, or any other, Press has turned out no more beautifully made book than this royal octavo volume of six hundred and eighty pages. It is a model of the art of mathematical printing, and seems to be as free from printer's error as only the careful English printer can be.

A glance at the short preface outlines clearly the scope of the work. It is a marshalling of the main results of the three distinct methods of investigation of Cauchy, Weierstrass, and Riemann. The general method which is adapted is an attempt to give a consecutive account of what may be fairly deemed the principal branches of the whole subject, and is not limited so that it may conform to any single one of the three principal independent methods ; ideas and processes derived from different processes have been combined where it has been convenient. In this respect this book is unique ; for while there is no dearth of treatises in French and in German on this subject, they, for the most part, expound the processes based on some single method, or they deal with the discussion of some particular branch of the theory.

There are five natural divisions of the book.

The first part, consisting of Chapters I-VII, contains the theory of uniform (single-valued) functions ; the discussion is based upon power series, initially connected with Cauchy's theorems in integration.

*THEORY OF FUNCTIONS OF A COMPLEX VARIABLE. By A. R. Forsyth. Macmillan & Co., New York. \$8.50.

The second part, consisting of Chapters VIII–XIII, contains the theory of multiform functions and of uniform periodic functions which are derived through the inversion of integrals of algebraic functions.

The third part, consisting of Chapters XIV–XVIII, contains the development of the theory of functions according to the method initiated by Riemann in his memoirs.

The fourth part, consisting of Chapters XIX and XX, treats of conformal representation.

The fifth part, consisting of Chapters XXI and XXII, contains an introduction to the theory of Fuchsian or automorphic functions, based on the researches of Poincaré and Klein.

The author closes his preface by remarking, “My aim has been to produce a book that will assist mathematicians in acquiring a knowledge of the theory of functions: in proportion as it may prove of real service to them, will be my reward.” His reward is assured. The American student is already deeply in debt to Forsyth, and we can but extend to him our grateful thanks in profound recognition of this new obligation he has placed upon us.

Macmillan & Co. announce a new treatise on the Theory of Functions by Professors Harkness and Morley which we await impatiently, and hope sincerely will prove a valuable addition to our subject matter.

It remains now for some one to put into English words Dini's Theory of Functions of a Real Variable, for us to possess a continuous exposition of Function Theory from Chrystal's Algebra through Forsyth's masterly work, which will enable the American mathematician to read up to the modern developments of this rapidly growing subject in his own language.